Date: Thu, 5 Aug 93 04:30:21 PDT
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V93 #2
To: Ham-Ant

Ham-Ant Digest   Thu, 5 Aug 93   Volume 93 : Issue   2

Today's Topics:
                        GAP antenna (2 msgs)
     How to calculate the resistance and reactance of a antenna?
              Newbie Scanner Antenna Questions (3 msgs)
             Some Fundamental Antenna Questions (3 msgs)

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
Send subscription requests to: <Ham-Ant-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Ant Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-ant".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Wed, 4 Aug 1993 13:56:17 GMT
From: sdd.hp.com!hpscit.sc.hp.com!hpuerca.atl.hp.com!edh@network.ucsd.edu
Subject: GAP antenna
To: ham-ant@ucsd.edu

For Maurice's benefit:
I've tried mailing you my feedback
(I don't own a GAP (yet) but have used and
know users who are very fond of them).

Your address bounced.

email me:
edh@hpuerca.atl.hp.com

Date: 4 Aug 1993 14:09:12 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!math.ohio-

state.edu!news.acns.nwu.edu!casbah.acns.nwu.edu!rdewan@network.ucsd.edu
Subject: GAP antenna
To: ham-ant@ucsd.edu

In article <CB6w83.1z53@austin.ibm.com> mcalle@austin.ibm.com (Calle) writes:
>
>Are the GAP antennas so bad that nobody in this group knows anything
>about it?
>

Bad enough!

About a year ago I was debating whether to buy or build a vertical.
To save time, I bought a GAP Voyager IV. It supposedly covers
160, 80, 40 and 20m.

On 40m it is a vertical dipole. This is the only band in which it works
well.

On 20 it is a double end fed dipole. Mediocre.

On 80 it is a 1/4 wave with three radials. Sucks rocks. Same as my
full wave loop that is only *20* feet up.

On 160 it is worthless - dummy load.

Let me clarify. I do not get thrilled to see SWR curves that match
the ones in brochure (they do). I work DX and like to hear weak
signals and compete in a pile up. I really care about the radiation
pattern. The only band in which this antenna is competent is the 40m band.

OTOH, if you get excited to see low SWR's from an "antenna" that does
not require any diddling to tune up then this is the antenna for
you. The Heath or MFJ C*antenna* should be a close second. ;)

Date: 4 Aug 93 16:50:24 GMT
From: ogicse!uwm.edu!linac!att!cbnewsm!jeffj@network.ucsd.edu
Subject: How to calculate the resistance and reactance of a antenna?
To: ham-ant@ucsd.edu

I am trying to use Mininec and a Smith chart program to learn more
about my G5RV and antennas in general. The problem I am running into
is they both seem to want the resistance and reactance of the antenna
which is part of what I am trying to find out. I am reading through
the ARRL antenna book and it did have a small chart on dipoles up
to about 65% of a wavelength that showed the a resonant dipole to

be about 70+j28 (is the symbology right?). However I am trying to
find out what it would be for a 3/4 wave dipole or any other length
that I might want to try out. What is the best way to go about finding
out this information? Thanks and 73!

Jeff

--
 Jeff Jones AB6MB | OPPOSE THE NORTH AMERICAN FREE TRADE AGREEMENT!
 jeffj@seeker.mystic.com | Canada/USA Free Trade cost Canada 400,000 jobs.
 Infolinc BBS 510-778-5929 | Want to guess how many we'll lose to Mexico?

Date: Wed, 4 Aug 1993 15:37:42 GMT
From: aio!pat!weed@ames.arpa
Subject: Newbie Scanner Antenna Questions
To: ham-ant@ucsd.edu

--
I recently bought a portable scanner that I would like to use in my
home with an external antenna rather than the short wick antenna it
came with.

Can anyone give me advice on antennas. What are the advantages and
disadvantages of the different types. Can I build my own? Any
problems putting the antenna in my attic? What cable to use - I've heard
RG-6/U is a good lower cost substitute for RG-8. What about RG-58?

The frequencies I will listen to are 30 to about 900 MHz. Can this
be covered adequately with one antenna?

Thanks in advance,

-- Dan

Daniel Weed   weed@pat.mdc.com
              "My comments are my own, not my employer's"

Date: Wed, 4 Aug 1993 18:12:03 GMT
From: pravda.sdsc.edu!news.cerf.net!usc!howland.reston.ans.net!math.ohio-
state.edu!uwm.edu!psuvax1!ukma!rsg1.er.usgs.gov!dgg.cr.usgs.gov!
bodoh@network.ucsd.edu
Subject: Newbie Scanner Antenna Questions

To: ham-ant@ucsd.edu

In article <1993Aug4.153742.16487@aio.jsc.nasa.gov>, weed@pat.mdc.com (daniel
weed) writes:
|>
|> --
|> I recently bought a portable scanner that I would like to use in my
|> home with an external antenna rather than the short wick antenna it
|> came with.
|>
|> Can anyone give me advice on antennas. What are the advantages and
|> disadvantages of the different types. Can I build my own? Any
|> problems putting the antenna in my attic? What cable to use - I've heard
|> RG-6/U is a good lower cost substitute for RG-8. What about RG-58?
|>
|> The frequencies I will listen to are 30 to about 900 MHz. Can this
|> be covered adequately with one antenna?
|>
|> Thanks in advance,
|>
|> -- Dan

--
A discone is a good wide coverage antenna. The original design of the
discone lacked good coverage for 30-50 Mhz. Grove (and others) sell a
version which has a "top hat" for 30-50 Mhz. Radio Shack sells a discone
but I don't think it has the low band top hat.

Don't scrimp on cable to save money. Pay the extra for RG8, particularly
if you expect to run over 25 ft or expect to listen above 400 Mhz...

++
+ Tom Bodoh - Sr. systems software engineer, Hughes STX, N0Y?? (in the mail) +
+ USGS/EROS Data Center, Sioux Falls, SD, USA 57198   (605) 594-6830   +
+ Internet; bodoh@dgg.cr.usgs.gov (152.61.192.66)
          +
+   "Welcome back my friends to the show that never ends!" EL&P
          +
++

Date: 4 Aug 1993 21:03:42 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!uclink.berkeley.edu!
michaeld@network.ucsd.edu
Subject: Newbie Scanner Antenna Questions
To: ham-ant@ucsd.edu

In article <1993Aug4.153742.16487@aio.jsc.nasa.gov>,
daniel weed <weed@pat.mdc.com> wrote:
>
>--
>I recently bought a portable scanner that I would like to use in my
>home with an external antenna rather than the short wick antenna it
>came with.
>
>Can anyone give me advice on antennas. What are the advantages and
>disadvantages of the different types. Can I build my own? Any
>problems putting the antenna in my attic?
^^This sounds like a job for:
DISCONE....

I'm in a similar situation, just having aquired a R/S Pro-39, so I went
back through all my old QST's and '73's. Score: QST nada, '73: BINGO!
I'd have to go back and look for the issue#, but it was built out of $20
in parts from the hardware store. And the author was building it for his
attic. The only catch was that his only goes from 144MHz to 1296MHz--not
down to 30MHz, as both you and I need.

Then I was looking through my 1991 Radio Works catalog (mostly baluns, and
wire ant. stuff...) and there it was: CAT # D-16 Discone Scanner Antenna,
for the sum total of $29.00...Still nor down to 30MHz, only 100MHz, but
claims to go up to 2.5GHz. (Radio Works is at 804-484-0140, fax only, or
BOX 6159 Portsmouth, VA 23703)

The only off-the-shelf discone that goes 30-1300MHz is the Diamond D130J,
which is apparently being discontinued. The cheapest I found it for was ~
$76.95 at National Tower Co. (I don't have their #, but 800-555-1212 should,
and they advertise in QST.).
They said that they had a few left as of Monday, 8/2).... What seems
to distinguish the Diamond discone from all the others I've seen is a vertical
element, on-axis, attached to the top of the disc--presumably this gives the
antenna the extended low-end? And, a discone will give a good enough match
on all the amateur frequencies that it covers to allow acceptable xmit as well.

If someone has/knows of plans for a discone that has the bandwidth of the
Diamond D130J, I'd like to know about it--please.
(just my $00.02...)

>What cable to use - I've heard
>RG-6/U is a good lower cost substitute for RG-8. What about RG-58?
^^How about RG-8x (mini-8)?
>
>The frequencies I will listen to are 30 to about 900 MHz. Can this
>be covered adequately with one antenna?
>

>Thanks in advance,
>
>-- Dan
>
>---
>Daniel Weed   weed@pat.mdc.com
>   "My comments are my own, not my employer's"

--
Michael Dahl/KC6UFR

Date: 4 Aug 93 17:49:24 GMT
From: ogicse!emory!kd4nc!ke4zv!gary@network.ucsd.edu
Subject: Some Fundamental Antenna Questions
To: ham-ant@ucsd.edu

In article <CB7r2B.Mpx@srgenprp.sr.hp.com> alanb@sr.hp.com (Alan Bloom) writes:
>Gary Coffman (gary@ke4zv.uucp) wrote:
>: ... A physically larger antenna will intercept more of the passing
>: wavefronts than a smaller antenna, *independent of frequency*. The absolute
>: power collection you get from a large antenna will be greater than from a
>: small antenna, even if both have the same directional gain.
>
>Not true. First of all, it is possible for a physically small antenna to
>have an aperture (capture area) much greater than its physical size.
>If you could build a 1 meter diameter loop antenna for the 80 meter band
>with zero loss, it would have an aperture nearly as large as a full-
>sized 80 meter dipole (about 800 square meters).

Of course you can't build an air core loop like that. You can ferrite load
it, which has the effect of concentrating the field lines in the immediate
area through the loop, in effect changing the physical characteristics of
the space near the antenna. But, avoiding such special cases, it remains
generally true that the amount of signal intercepted depends on the
size of the antenna, assuming other confounding factors like matching,
or modifying the physical properties of the vacuum, are normalized.

>Any two antennas (on the same frequency) with the same gain have the
>same aperture, according to the equation A = lambda^2 G / (4 PI), where
>A is the aperture, lambda is the wavelength and G is the gain.

Note that the above formula is often used to show that path loss
increases with the square of frequency, but that's not really true.
There aren't greater physical losses over the path, just smaller
apertures for the physically smaller antennas of the same gain to
catch the wavefronts. If the antennas are kept the same physical

size, the "path" loss magically becomes the same. That's why a halfwave dipole at 80 meters collects millivolts while a halfwave dipole at two meters collects microvolts when the same distance from the same power transmitter. Both have the same *gain*, but different apertures. The physical characteristics of the path don't change. That's why I was careful to distinguish between the cases "independent of frequency" and those of a "given frequency" in the original post.

Note that I was careful to distinguish between directional gain and gain over a reference antenna in the original post too. The first is merely a measure of asymetry of the antenna pattern. Perhaps that didn't come through clearly. Perhaps I should try to restate it. Some antennas with very sharp patterns still aren't very good antennas because they don't capture very much signal. An example might be a three "tower" array of stubby duckies compared to a 1/4 wave telescoping vertical. The duckie array could have directional gain greater than the 1/4 wave, but still show lower absolute signal strength. I'm saying the little antennas don't intercept as much of the impinging wavefronts.

Gary
--

Gary Coffman KE4ZV	You make it,	gatech!wa4mei!ke4zv!gary
Destructive Testing Systems	we break it.	uunet!rsiatl!ke4zv!gary
534 Shannon Way	Guaranteed!	emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244		

Date: Wed, 4 Aug 1993 18:31:52 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!spool.mu.edu!torn!mcshub!cebnet!mike@network.ucsd.edu
Subject: Some Fundamental Antenna Questions
To: ham-ant@ucsd.edu

>From: gary@ke4zv.uucp (Gary Coffman)
>
>Subject: Re: Some Fundamental Antenna Questions
>
>...stuff omited
>
>Well there's something to this, sort of. It's called aperture, or capture
>area. A physically larger antenna will intercept more of the passing
>wavefronts than a smaller antenna, *independent of frequency*. The absolute
>power collection you get from a large antenna will be greater than from a
>small antenna, even if both have the same directional gain.

The important parameter is the effective aperature Ae. It is roughly
related to the physical size: example: an ideal dish antenna would have
an Ae = physical aperture, but a practical one would have an effective
aperature slightly less (due to transmision or absorption in the reflector
for one thing. A 1/2 wave dipole has an effective aperature ?(I don't have
the number handy but it is related to the wavelength and comes out to
an area of about half a wave squared, give or take)

Now here is what may be counterintuitive: a small dipole (much less than
1/2 wave) will also have an effective aperature almost as much as the
resonant half wave. (also the pattern is almost as sharp)
Thus the effective aperature is much larger than
the physical antenna size.   Such an antenna will pull in signal from
greater than its physical size. Such an antenna must be tuned up for a
proper match (so it doesn't reflect signal back into space). And this
means that it needs to be made very conductive so that resistive losses
dont spoil everything

NOTE: if thick copper is used for the element and load coil a say 1/10 wave
dipole may approach the performance of a 1/2 wave dipole.

>
>...stuff omited
>

Date: 4 Aug 93 16:43:27 EST
From: titan.ksc.nasa.gov!k4dii.ksc.nasa.gov!user@ames.arpa
Subject: Some Fundamental Antenna Questions
To: ham-ant@ucsd.edu

In article <CB7qpA.MI2@srgenprp.sr.hp.com>, alanb@sr.hp.com (Alan Bloom)
wrote:
> However, the aperture (capture area) of the 80 meter antenna would be
> 40^2 = 1600 times bigger. The formula is:
>
>   A = (lambda)^2 G / (4 PI)
>
> where A is the aperture, lambda is the wavelength, G is the gain over
> isotropic and PI is 3.14... So the path loss (ratio of transmitted power
> to received power) would be 1600 times (32 dB) greater on 2 meters
> (assuming free space).

AL-

I recall a factor of 20 times the log of frequency, in the radio range equations. This works out to the 32 dB you mentioned above, comparing 2 meters with 80 meters. Is capture area the source of this factor, or is it just a coincidence?

73, Fred, K4DII

Date: (null)
From: (null)
The ironical part is that when I was considering the antenna, I read all about it and figured that it would be good in the 40m band. The rest were a mystery. Now I know. There is no mystery or magic. Live and learn.

Low SWR - phooeey!!

Not my smartest ham-radio related purchase.

I guess I am little upset with myself for buying one.

Rajiv
aa9ch
Address: r-dewan@nwu.edu
Phone: None on HF. Only CW.
Look for aa9ch/m on bottom end of 30m.

Date: Wed, 4 Aug 1993 23:09:55 GMT
From: olivea!apple.com!goofy.apple.com!michael.apple.com!ems@uunet.uu.net
To: ham-ant@ucsd.edu

References <2314a5$40j@news.acns.nwu.edu>, <236sg9$515@skeena.ucs.ubc.ca>, <1993Aug3.131552.1409@muvms6.wvnet.edu>g
Subject : Re: Trunk Lip Mount Antenna?

In article <1993Aug3.131552.1409@muvms6.wvnet.edu> desaid@muvms6.wvnet.edu writes:
>In article <236sg9$515@skeena.ucs.ubc.ca>, taganov@unixg.ubc.ca (Robert Edgar Froese) writes:
>> In article <2314a5$40j@news.acns.nwu.edu> rdewan@casbah.acns.nwu.edu (Rajiv Dewan) writes:
>>
>>>If you are worried about rusting, then insist on stainless steel set
>>>screws too. I have seen a Diamond TL mount after use for a few months
>>>and it is not a pretty picture. While the body is made of SS,
>>>the set screws are steel and were completly rusted.

>> _____________
>> I have an Engineer friend (my Dentist, actually) who told me that an
>> electrochemical potential exists when Stainless Steel and normal, auto
>> grade steel are brought together that results in fantastically accelerated
>> corrosion at the mating point. Seems that this could have been what
>> caused your screws to go so fast, and if you used stainless screws, the
>> holes would probably go first. I haven't asked him about Brass, but will
>> be sure to do so when I get my next mercury filling...

What you really want to do is what the guys who live on boats do. Put
a chunk of zinc at the car / antenna junction as a sacrificial anode.
Find a local source of zinc and just add it to the sandwich. I'd go
for sheet zinc from the local science shop and put a strip of it
on the set screws.

You will have to replace it every so often, but the iron and Stainless
Steel should be protected just fine.

--

E. Michael Smith ems@apple.COM

'Whatever you can do, or dream you can, begin it. Boldness has
 genius, power and magic in it.' - Goethe

End of Ham-Ant Digest V93 #2
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